

58. A stably transformed, transgenic plant or plant organ, characterized in that said plant or plant organ contains a endo-glucanase modified carbohydrate composition, said plant or plant organ being made by the method of claim 1.

Cancel claims 59-60.

R E M A R K S

Claims 1, 19-23, 27, 28, 33-36, 38, 39, 41, 42, 44, 47, 48, 50, 51 and 54-58 are pending. Claims 19-23, 33-35, 38, 41, 44, 47, 50 and 53 stand withdrawn from consideration by the Examiner as directed to a nonelected invention. Claims 1, 27, 28, 36, 39 and 42 have been amended and claims 26, 45 and 59-60 have been canceled without prejudice. The subject matter of canceled claim 26 is included in claim 1 as is the subject matter of claim 54. The subject matter of canceled claim 45 is included in claim 42. The other amendments to the claims either address concerns raised by the Examiner or was necessitated by other amendatory changes, e.g. claim dependency changes resulting from a claim cancellation. The objection to claims 59 and 60 are rendered moot by their cancellation.

Support for the amendatory changes to claim 1 are found in claims 26, 36 and 54.

It is respectfully requested that the request for drawing corrections be held in abeyance until the application is otherwise in a condition for allowance.

Claims 1, 26-28, 36, 39, 42, 45, 48, 51, 54-58 are rejected under 35 USC 112, first paragraph, because the specification does not enable the any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with the rejected claims. Examiner notes that the production of transgenic potato plants that express both alpha-amylase (*Bacillus licheniformis*) and glucoamylase (*Aspergillus niger*) is enabled but finds that the specification does not reasonably provide enablement for all methods of modifying carbohydrate of any transgenic plants that

express any DNA sequence of any primary enzyme of interest capable of degrading polysaccharides, as required by the claims. Applicants traverse.

Claim 1 has been amended to address the issues raised by the Examiner. As amended, claim 1 includes the subject matter from claims 26, 36 and 54. The nature and site of the carbohydrate modification is identified. The glucanase activity is identified. The type and function of regulatory and leader sequences is set forth.

Representative glucanases are set forth on page 6, starting at line 20. Useful targeting leader sequences are set forth starting at line 25 on page 10. Useful regulatory sequences are set forth starting on line 24 of page 9. Suitable plants are illustrated on page 8 starting at line 25.

The examples, especially Examples 3-5, 7-8, and 11-12 illustrate the operation of the invention in a variety of plants, e.g. potato, tomato, tobacco, using various approaches, e.g. agrobacterium, tuber-specific expression construct, and enzymatic modification of carbohydrates at various sites, e.g. leaves, roots and fruit. The specific types of glucanase used is not critical. Their selection is based on the desired end. The known carbohydrase action patterns(s) would aid in the specific selection as would the degree and type branching present in the carbohydrate material. These are the type of selections which would involve at best routine experimentation.

The delivery of the enzymes to a desired site merely involves the selection of a known regulatory element or targeting leader. The elements for doing this are known. The specification, especially the examples, illustrate the operation of the invention. Following, these teachings using conventional materials is not seen to involve undue experimentation, especially as to the claims as amended. The stated object is merely to modify carbohydrate composition of the plant. This does not necessarily require the maintenance of a trait. The nature of the modification, e.g. presence of oligo- and/or monosaccharides, is described as is its monitoring using conventional assays.

The points raised by the Examiner on pages 5 and 6 of the Official Action do not address the sufficiency of the teachings provided within the specification or their sufficiency in the context of the invention as now claimed.

Withdrawal of the rejection is respectfully requested.

Claims 1, 26-28, 36,39,42,45,48, 51 and 45-58 are rejected under 35 USC 103 as being unpatentable over Lawson et al., Doi et al. and Robinson et al. in view of Castresana et al. Applicants respectfully traverse.

It is not apparent from the face of the references why their combination is suggested. There is no problem recognized by one for which another suggests a solution.

The assembled references merely show the existence of techniques but there is no clear reason why or guidance as to how the teachings would be combined to arrive at the claimed invention. None of these references is concerned with the modification of the carbohydrate composition of a plant. There is no reference which desires to enhance oligo- or monosaccharide concentration in plants to permit extraction or to render the plant more suitable for a food application due to its modified carbohydrate composition. } < 7 1

Accepting the Examiner's characterization of the teaching as given, it is not seen how the existence of a transgenic potato resistant to mixed viral infections combines with gn1 studies in tobacco plants, cloning of a DLG beta-1,4-glucanase gene and its expression in E. coli and B. subtilis and a similar study dealing with the cloning and expression in E. coli of an Arthrobacter beta-(1→3)-glucanase.

A prima facie case of obviousness does not exist.

Withdrawal of the rejection is respectfully requested.


CONCLUSION

Applicants have amended the claims to obviate the rejections raised under 35 U.S.C. § 112. Applicants have further demonstrated that methods for introducing a transgene into a cassava plant and the subsequent regeneration of cassava plants from the transformed cassava plant cells were known in the art at the time of the present invention. Such methods could be used in the present invention without undue experimentation. Accordingly, Applicants respectfully request that the Examiner reconsider the rejections of the claims, that he withdraw same, and that he pass the application to issue. If, in the Examiner's opinion, a telephonic interview would expedite the prosecution of this case, he is respectfully requested to contact Applicants undersigned representative at (202) 887-1678.

In the unlikely event that the transmittal letter is separated from this document and the Patent Office determines that an extension and/or other relief is required, applicant petitions for any required relief including extensions of time and authorizes the Assistant Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to **Deposit Account No. 03-1952**. However, the Assistant Commissioner is not authorized to charge the cost of the issue fee to the Deposit Account.

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